SAY HELLO TO BIG EDDY: A global model for international cooperation for ecosystem-based oceans management and MPA development

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Abstract

In 2003, an international marine conservation initiative was launched in the transboundary area known as the Big Eddy off the west coast of Vancouver Island, Canada and the northwest coast of the Olympic Peninsula of Washington State, USA. The area is named after the Juan de Fuca Eddy, a seasonal, nutrient rich coastal upwelling that drives one of the most productive ecosystems on the North American continental margin. The ecological richness of this area is matched by its social and economic importance. The Nuu-chah-nulth and Makah First Nations have lived in the area for thousands of years. The area is a globally famous destination for tourism, and supports one of North America's most important recreational and commercial fishing grounds, second only to Georges Bank. Spearheaded by the Canadian Parks and Wilderness Society (CPAWS), an international, multi-agency steering committee was convened, including NGOs, government agencies and Indigenous representation to develop a common vision for transboundary ecosystem based management, including marine protected areas. A recent scientific symposium has confirmed the exceptional ecosystem values of the Big Eddy and the potential to establish a global model for transboundary ecosystem-based oceans management. Work is currently underway to raise public and political awareness and support. Through this case study, the role of non-government sectors, as well as the issues and challenges of transboundary marine conservation are described.

Introduction

The crisis in the world's oceans is becoming of increasing concern to scientists, governments and the public. It is forcing managers to realize that sectoral, ad hoc and short-term management measures do not adequately recognize the interconnectedness of ocean ecosystems and uses, and have led to resource overexploitation and environmental degradation. To prevent this from continuing, management must progress to a more systematic, holistic and integrated approach, including: international cooperation; ecosystem based management; and marine protected areas (MPAs).

In both Canada and the United States, ocean conservation issues are receiving increased national attention. In the US, the Commission on Ocean Policy (2004) and the Pew Oceans Commission (2003) have recently released reports highlighting the serious threats facing ocean ecosystems and have made a series of recommendations for addressing these threats, including the need to provide better ocean governance at an ecosystem level, as well as promoting the use of marine protected areas (MPAs). In Canada, the federal government has recently made commitments to address ocean issues and establish MPAs, including the commitment to an Oceans Action Plan (Fisheries and Oceans Canada 2005) in the most recent Speech from the Throne (February and October 2004) and the 2005 federal budget (Finance Canada 2005).

The need to work cooperatively across international borders in the marine realm has been recognized by the leaders of many countries. At the recent international fisheries conference in St. John's, Newfoundland, Canada's Prime Minister, Paul Martin (2005) noted that, "Fish respect no borders. Our oceans refuse to be bound by the jurisdictional lines we draw on them." At the 2005 Puget Sound Georgia Basin Research Conference, Congressman Jay Stiles noted "the fish are not checking their passports at the border." And, at their meeting in Waco, Texas in March 2005, the leaders of Canada, Mexico and the United States released a statement announcing the establishment of the Security and Prosperity Partnership of North America (Bush et al 2005). Within the joint stewardship of the environment component of this statement, there is a commitment to:

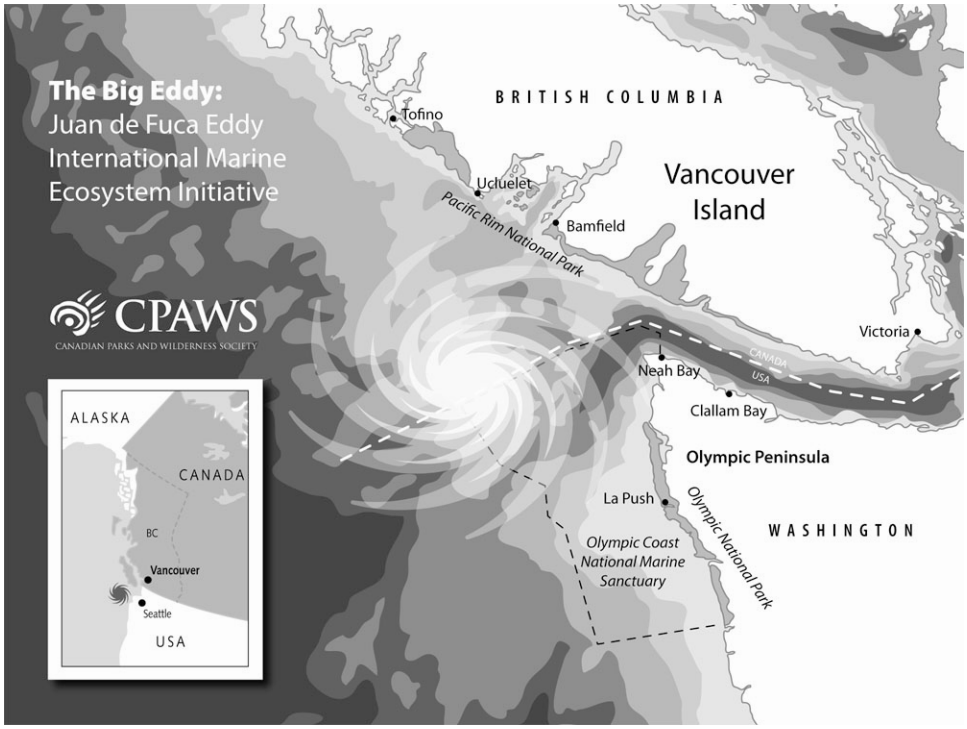
> Develop complementary strategies for oceans stewardship by emphasizing an ecosystem approach, coordinating and integrating existing marine managed areas, and improving fisheries management (President George Bush, President Vincente Fox and Prime Minister Paul Martin 2005).

A joint study by the North American Commission for Environmental Cooperation and the Marine Conservation Biology Institute (Morgan et al. 2005) identified areas of exceptional conservation value (priority conservation areas – PCAs) on the west coast of North America from Baja California to the Bering Sea. One of the PCAs identified is the Juan de Fuca Eddy ecosystem that straddles the Canada/US border off the coast of Washington State's Olympic Peninsula and the west coast of southern Vancouver Island (Morgan et al. 2005: 62-63)

What is the Big Eddy?

The Juan de Fuca Eddy ecosystem, affectionately known as the "Big Eddy" is the transboundary area off the west coast of Vancouver Island in British Columbia, Canada and the northwest coast of the Olympic Peninsula in Washington, USA. The area is named after the Juan de Fuca Eddy, a seasonal nutrient-rich eddy that drives one of the most productive ecosystems in North America.

This nutrient-rich and productive ocean ecosystem has sustained aboriginal cultures for thousands of years, and the region continues to be one of the most important fishing grounds on the west coast of North America. Recreation and tourism, together with shipping, include some of the other important uses of this marine realm.



The Big Eddy provides an exemplary opportunity for international cooperation and coordination of research, management and conservation efforts, due to its location straddling the international border and due to existing initiatives for management and conservation.

The Big Eddy Initiative

An exciting new initiative to protect and conserve the shared waters of the Big Eddy was begun last year. The ultimate goal of the Big Eddy initiative is to develop a stewardship regime that includes marine protected areas and ecosystem-based management in the Juan de Fuca Eddy region that is implemented in a cooperative way across the international boundary.

One idea that is being explored is the possible establishment of an international marine "peace park" that would link the Olympic Coast National Marine Sanctuary with a new national marine conservation area on the Canadian side, adjacent to Pacific Rim National Park. Outside the "peace park" the vision is to establish a broader collaborative ecosystem-based management regime.

International peace parks "provide possibilities for promoting biodiversity conservation and sustainable use across politically divided ecosystems, while at the same time encouraging international collaboration in management, the sharing of experience and the sharing of information" (UNEP 2004). While to date they have been predominantly terrestrial, we are beginning to understand their importance in the marine realm as well.

Nelson Mandela (2001), one of the founders of the Peace Park Foundation in South Africa has said

> "I know of no political movement, no philosophy, no ideology, which does not agree with the peace parks concept as we see it going into fruition today. It is a concept that can be embraced by all. In a world beset by conflicts and division, peace is one of the cornerstones of the future. Peace parks are a building block in this process, not only in our region, but potentially in the entire world."

Ecological Values of the Big Eddy Region

A number of factors come together in this region to make it one of the most productive ecosystems on west coast of North America. The Big Eddy is at the opening of the Georgia and Juan de Fuca straits where Pacific waters mix with water from the nutrient-rich plume from the Fraser River. Located within the coastal upwelling production zone (where deep nutrient rich waters are brought up to the surface), the upwelling in this area is enhanced through its steep bathymetric features such as canyons and seamounts. A wide range of physical features such as canyons, shelves, banks, inlets, estuaries and islands provide a diverse of array of habitats. The semi-permanent Juan de Fuca Eddy then circulates the nutrients throughout the ecosystem to these diverse habitats (Thomson 2005). This region is the convergence point (biogeographical transition area) for many species - it encompasses the northern boundary of southern species and the southern boundary of northern species, and the stop-off or end point on many migratory paths. This results from the split of the major trans-Pacific ocean current into the northern flowing Alaska current and the southward flowing California current in this region (Robinson 2005).

The diversity of habitats and convergence of ocean currents, accounts for the rich biodiversity in the Big Eddy, with thousands of species that reside or migrate through the Big Eddy, including important populations of fish, seabirds, turtles, whales and pinnipeds, and benthic communities and species, including corals.

Seabirds: The bird community in this region is the most diverse in the North Pacific. Research conducted by University of Victoria scientist showed that high densities of seabirds found on the shelf are almost double the densities found in the nearshore region. The large concentrations of seabirds foraging in the region's waters include Common murre, rhinorceros auklet and tufted puffins (Burger 2005; Morgan et al. 2005).

Marine Mammals: Over 20 different species of marine mammals use these waters. Over 15 species of whales including humpbacks, fins, grey, and orcas may be found here, although populations of many whales are down from their original numbers due to the legacy of heavy commercial whaling in the early 1900s (Calambokidis 2005).

Pinnipeds: Elephant seals, harbour seals, sea lions and sea otters inhabit this area. As the gateway to the Strait of Georgia and the Puget Sound, the Juan de Fuca Eddy region sees many pinnipeds move in seasonally, although they breed elsewhere. Sea otters were re-introduced to the Olympic Coast National Marine Sanctuary (OCNMS) in 1969/1970 so that there are now over 600 animals in the Washington State populations. In BC the translocation of sea otters to the Bunsby Islands south of Brooks Peninsula has also been successful with approximately 2000 animals now on the west side of Vancouver Island, almost reaching to Tofino today (Jeffries 2005).

Fish: Important fish species found in the region include salmon, herring, hake, as well as eulachon, mackerel and sardine. Pacific halibut and Dover sole are also found here, together with various rockfishes which are associated with the high relief areas of the region (Morgan et al. 2005).

Benthic Communities: Limited studies of benthic communities have continued to identify new species. Glass sponges, as well as black and gorgonian corals are found along the continental slope, but there are concerns about them being damaged by trawling in the region (Lambert and Brancato 2005;Morgan et al. 2005).

Economic and Social Values of the Big Eddy Region

For thousands of years, the rich marine resources of the Big Eddy region have sustained one of the most advanced aboriginal cultures in the world. In Washington State, the area is home to the Makah, Quileute, Hoh and Quinault Indian Tribes. In British Columbia, the Nuu chah nulth Tribal Council represents the chiefs and membership of 14 first nations on the West Coast of Vancouver Island from Brooks Peninsula north of Kyuquot to Sheringham Point south of Port Renfrew. In addition to these First Nations, the Pacheedaht First Nation also calls this region home.

The coastal communities in this region in both BC and Washington are also intimitely connected to this ecosystem and include in British Columbia – Tofino, Ucluelet, Bamfield, Port Renfrew, Ahousat, and Clo-ose, and in Washington State - Neah Bay, Forks, La Push, and Sekiu.

The Big Eddy region is one of North American's most important recreational and commercial fishing grounds. Commercial and sport fisheries include salmon, hake, sablefish, herring and crab. The region is also a migration corridor for returning salmon and an important feeding ground for transboundary migratory fish stockes, like Pacific hake. In the 1980's, La Perouse Bank on the Canadian side of the region was one of the most productive fishing zones in the Northern Hemisphere with commercial fish catches averaging 5-6 tonnes/sq km/year, second only to the Grand Banks (Fisheries and Oceans Canada 1992:1)

Important shipping routes along the west coast of North America and between North America and Asia converge in the Big Eddy region. Marine traffic also passes through the Big Eddy area to the ports of Vancouver and Seattle, as well as Victoria and Port Angeles.

A variety of industries are developing in the region around marine technology, aquaculture and energy production. New scientific research, through the Neptune project is also focused on the Juan de Fuca Eddy region, and will bring a 3,000-km network of fiber-optic/power cables and 25 experimental sites established at nodes along the cable. These sites will provide information on physical, chemical, and biological phenomena that operate at various scales of space and time. The network will provide real-time information and command-and-control capabilities to shore-based users via the internet (Neptune 2005).

On both sides of the border, coastal communities are popular tourist destinations - Tofino alone receives more than one million visitors/year and over three million people visit the Olympic Peninsula each year. Many seasonal activities are focused on the grey whale migration that occurs within sight of land, and has inspired generations of people who are awed by both the scope of the migration, the longest of any mammal in the world, to the tenacity of the eastern pacific grey whale which has twice returned from the brink of extinction.

The ecological significance of these waters has received some recognition locally and regionally and is partially protected on both sides of the border by the Pacific Rim National Park Reserve, a series of provincial marine parks, and the UNESCO Clayoquot Sound Biosphere Reserve in British Columbia and the Olympic Coast National Marine Sanctuary and Olympic National Park in Washington State.

Threats to the Big Eddy Region

An array of threats stemming from human activities are undermining the integrity of the Big Eddy region. The current ecosystem stressors include:

- discharges by ships including ballast water and oil spills
- physical disturbance of sensitive habitats & species including deep water corals, by cable installations, bottom trawling, longlining, etc
- impacts from commercial and recreational fishing

- acoustic disturbances from military operations
- toxin loadings, which are affecting marine mammals and salmon
- potential future impacts from offshore aquaculture operations currently under consideration (CPAWS 2005: 43-5).

In addition to concerns around these individual threats, the increasing human activities and accelerating resource uses are placing cumulative stressors on the environment. This situation is leading managers and others concerned about the long term ecological integrity of the region to support the need for ecosystem-based management (CPAWS 2005:45)

Role of NGOs

NGOs are often uniquely placed to play a leadership role in advancing conservation initiatives. They are often in the forefront of identifying areas of significant concern and opportunity, and have shown the ability to build support and a framework for action to advance these initiatives. By working across sectors from the political to the bureaucratic, from communities to individual stakeholders, NGOs can identify key issues, facilitate and coordinate cooperation and communication, and develop the support needed to ensure success.

The Canadian Parks and Wilderness Society (CPAWS) has played a leading role on the Juan de Fuca Eddy project, from developing the concept of an international transboundary conservation initiative in this region, to facilitating and coordinating the efforts of a variety of interests and organizations. The initiative has received support from the US and Canadian governments, and is gaining much local interest and support as news of the Big Eddy is disseminated. Building this community support will be key to ensuring the level of political support that will be required to implement new approaches to marine conservation in this region - approaches that can transcend the international boundary especially in an era of increased concerns over security and protecting the integrity of these very boundaries.

CPAWS is a national charitable organization established in 1963, providing a grassroots voice for wilderness. Since its founding in 1963, we have helped protect over 40 million hectares of Canada's most treasured wild places. The British Columbia chapter of CPAWS (CPAWS-BC) has developed an acknowledged expertise in marine conservation. Our focus is on the establishment of a comprehensive network marine protected areas on the BC coast. Since 1993, CPAWS-BC has been working with communities, First Nations, government agencies, conservation groups, fishing organizations and others in our efforts to ensure the long-term health of BC's marine environment. We have been active on a number of fronts, including identifying and documenting potential MPAs and the development of policy and legislation for marine protected areas (MPAs).

As an organization with nation-wide interest, CPAWS is well positioned to assess a broad range of issues for marine conservation and oceans management and frame them within the appropriate international, national and provincial political and management contexts to identify robust opportunities.

Promoting the development of an international initiative like the Big Eddy initiative is a balancing act which requires the planned and deliberate nurturing of on-the-ground community level support at the same time as political and management level support are cultivated, on both sides of the border. NGOs are in a good neutral position to serve as an important convening body and facilitator for these processes. NGOs can keep the momentum of building public and stakeholder support while using international pressure from both sides of the border to progress the initiative on a political level.

Progress on the Big Eddy Initiative

At the present time, the ecological importance of this area and the significant conservation opportunity has not been broadly recognized. Under CPAWS leadership, a core group of people in government agencies, NGOs (non-government organizations), and community organizations who recognize the exciting opportunity to foster international cooperation in this marine realm is working together to protect one of the most productive marine ecosystems on the west coast of North America.

An international steering committee was established with representation from US and Canadian federal government departments, First Nations and Indigenous organizations, local communities, academic institutions and non-government organizations. Currently the steering committee includes members from Pacific Rim National Park, Olympic Coast Marine Sanctuary, Fisheries and Oceans Canada, Surfrider Foundation, Makah Tribe, West Coast Vancouver Island Aquatic Management Board, and the University of Washington's School of Marine Affairs. The steering committee is working to expand its membership and gain greater community awareness.

As a first step, CPAWS and its steering committee partners, convened a joint Canada/US scientific symposium. Over two days, more than 60 participants, including scientists (government and non-government), managers, Canadian First Nations and Native American tribes confirmed the ecological, economic, social and scientific importance of this transboundary marine region driven by the Juan de Fuca Eddy. The overall conclusion of the symposium was that this region has a unique identity, exceptional values, provides significant opportunities for international cooperation, and has the potential to establish a global model for transboundary ecosystem-based management (CPAWS 2005).

Some Key Findings of the First Big Eddy Symposium

The first Big Eddy Symposium provided an important summary of the key values of the ecosystem and highlighted the regional and global significance of this region.

> "In human terms, the area represents a dramatic transition between a pristine ocean environment and a heavily urbanized area. This gateway to a region of high human population with cities and ports lies between two major rivers – the Fraser and the Columbia. In ecosystem terms, this is a dynamic area where deep ocean currents funnel through to the shore to meet and mix with massive amounts of nutrient rich runoff waters from the adjacent rainforests." (CPAWS 2005).

In addition to providing a summary of what is currently known about the Big Eddy ecosystem through traditional knowledge and scientific research conducted to date, the first Big Eddy Symposium also identified the significant gaps in fundamental baseline information about the ecosystem and ecological linkages and interactions. Symposium participants called for long-term observation and monitoring of the region in order to understand trends and evaluate variations, and to build ecosystem-based models. The important role of traditional ecological knowledge and the special understanding and knowledge of First Nations and Tribes in the region was emphasized at the symposium.

Discussions of human activities in the region and existing and potential threats to ecosystem values highlighted the need to embark on ecosystem-based management and international cooperation, as well as the need to identify potential tools, like marine protected areas, that are available to protect biodiversity. The symposium culminated in a discussion on cooperation – both international and with First Nations and Tribes. A key learning from these discussions was the link between the holistic perspective of indigenous people and ecosystem-based management and the need to embrace more personal interactions in order to facilitate better cross-cultural understanding.

More effective management of the Big Eddy ecosystem requires clearly articulated and shared priorities that are embraced by the public. Building public awareness and support is clearly linked to building political support for the policy and management innovations required to protect and manage the ecosystem values of this region. Improved understanding and expanded public awareness of the 'Big Eddy' was seen as key to ensuring a healthy ecosystem and sustainable use of its resources.

Future Plans

The plan for the "Big Eddy" in the coming year has three main objectives: (1) to develop awareness and gain the support of local communities and organizations in the region; (2) to develop political support at the local, state/provincial, and federal levels for the initiative; and (3) convene a second symposium focused on management, use, future needs and conservation considerations.

Before convening the second symposium, we are meeting with the key community interests and organizations in both countries to present the findings of the first symposium, determine their issues and concerns, explore how we

can build on existing local efforts and arrangements, and solicit their support for and engagement in the initiative, including their participation in the second symposium. Based on the results of these discussions and the second symposium, we will develop an action plan for achieving progress on our goals.

Challenges and Opportunities

Working in a transboundary and international arena, has posed both opportunities and challenges. The most important opportunity that this initiative presents is being able to achieve conservation on the scale of the ecosystem. The concept of an international marine peace park and stewardship regime has generated great interest and excitement, and presents many leverage opportunities between the two countries, whether between national governments, First Nations or NGOs. It is our hope that this kind of excitement and interest will lead to broader funding opportunities.

However, many challenges remain, including incompatible scientific data, increased numbers of governments, stakeholder groups and local communities to work with, and different management regimes that reflect differing management and conservation objectives.

Conclusion

The degraded state of marine ecosystems globally makes it clear that coordinating management and providing precautionary, long-term protection is needed to ensure the continued productivity of ocean oases like the Juan de Fuca Eddy ecosystem. The challenge of effectively managing natural systems that cross international borders requires interjurisdictional and international cooperation. This has been highlighted in both the US Oceans Commission Report (2004) and in Canada's Oceans Action Plan (Fisheries and Oceans Canada 2005), as well as in other national and international statements and commitments. The Big Eddy initiative provides an opportunity to put these principles into action. Our hope is that the Big Eddy will become a model for international management and conservation of shared marine resources. NGOs, such as CPAWS, can play a lead role in promoting and advancing international cooperation in oceans conservation and management
in order to achieve conservation and overall sustainability.

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